



## Gasoline, Diesel, and Fuel Oil Specifications

**Topic ID** OEA29T  
**Title** Gasoline, Diesel, and Fuel Oil Specifications  
**Category** M-Manage Infrastructure  
**eLearning Level** Basic

### Introduction

Gasoline is a combination of hydrocarbons and many other chemicals used to fuel engines with spark ignition. One of the most important economic challenges for a gasoline refiner is choosing the best mix of elements to manufacture the final gasoline fuel. Unfortunately, blending fuel is far more difficult than simply combining different components.

**This topic discusses fuel specifications and explains the significance of each of the quality specs and its mode of control during manufacturing.**

### Gasoline, Diesel, and Fuel Oil Specifications

For typical gasoline, RON ranges from 83-98, and MON ranges from 76-85. To refer to gasoline as reformulated, it should have at least 2% oxygen, no more than 1% benzene, and no metals. This leads to no rise in NOx emissions and obtains the necessary decrease in TAP and VOC pollution.

The goals for the decrease of TAP and VOC emissions are enforced in two steps. First, from 1995 to 1999, the Phase I regulations mandated a decrease in VOC and TAP emissions by a minimum of 15% relative to emissions in 1990. Phase II emission regulations came into effect on 1 January 2000 and further decreased TAP, VOC, and NOx.

Phase I was introduced in two segments. The first move came into practice in 1995. It employed a simple framework focused on a chemical's Reid Vapor Pressure and its oxygen, benzene, and aromatic content.

A complex framework replaced the simple framework under the second phase on 1 January 1998. It defined the pollution impact of oxygen, benzene, aromatics, RVP, olefins, sulfur, and the amount of fuel dissipated at 200 and 300 Fahrenheit.

Diesel requirements limit pollution from two factors: on-road vehicles and non-road facilities. Ultra-low sulfur diesel fuel (ULSD) was introduced for on-road diesel between 2006 and 2010. After 2010, the EPA diesel regulations mandated that all highway diesel fuel sold to the sector be ULSD and that all highway diesel vehicles should use ULSD.

The presence of sulfur in crude oil is natural. However, it results in poor air quality, negatively influencing consumer health and the environment. Catalytic converters change sulfur into sulfur dioxide when gasoline is consumed. Decreased sulfur fuel keeps vehicles cleaner, reducing CO, HC, and NOx pollution from gasoline cars fitted with catalytic converters.

China is planning to decrease sulfur to less than 500 ppm. Australia, Hong Kong, and Japan aim to reduce it to less than 10 ppm in potential gasoline and diesel. Europe implemented mandatory environmental fuel requirements for a maximum sulfur limit of 500 ppm in 1996, 350 ppm and 51 cetanes in 2000, 50 ppm in 2005, and 10 ppm in 2009.

### Summary

Most countries aim to reduce sulfur in gasoline and diesel because decreased sulfur fuel reduces CO, HC, and NOx emissions.

Mode of eLearning	Available?
Free Course	No
Refresher Course	No
Pick N Choose (Custom Curriculum)	Yes
Advanced Level Course	Yes
Structured MCOR Curriculum	Yes